

PLEASE READ THESE INSTRUCTION CAREFULLY BEFORE YOU START TO ASSEMBLE THE ACTUATOR

Kit contents:

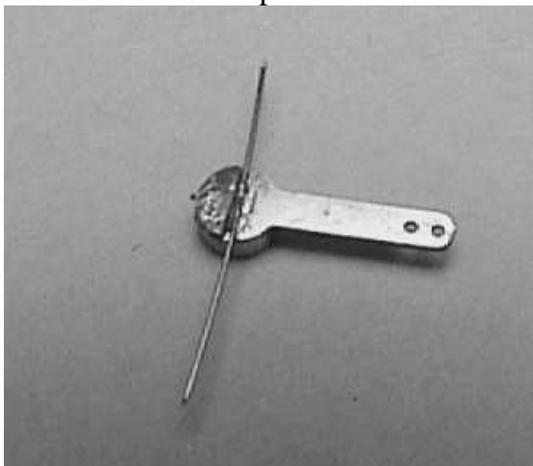
2 pcs. 3x1mm N50 magnets
1x0.5mm N50 magnet
0.2mm music wire
Output arm
Crescent shaped spacer
Swing frame
Shrink tube
0.25mm brass wire



Picture shows two kits

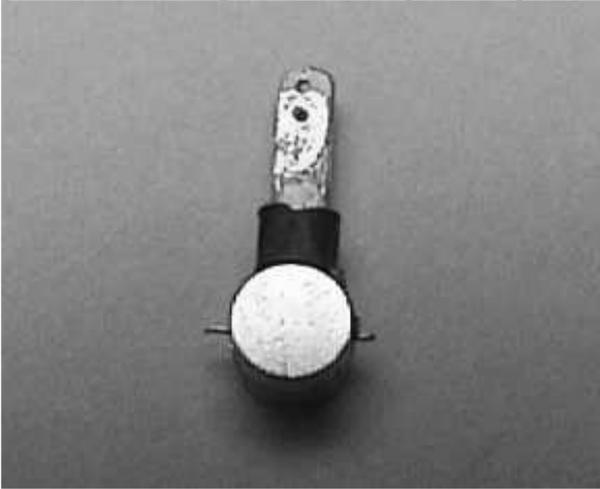
Build sequence

Stick one of the 3x1mm magnets onto something metal to hold it in place. Use a needle to apply a TINY amount of CA or epoxy glue on the top surface of the magnet. Place the music wire in the center of the magnet (mw is magnetic and stays put) and place crescent shape spacer on one side of the wire and the output arm on the other side of the wire



Apply a little glue on top of this and put the other 3x1mm magnet on top of the assembly so the brass/mw parts are sandwiched between the two magnet. Epoxy is best because it allows you to reposition parts if you did not get it quite right. If there is any glue on the mw that protrudes from the assembly then carefully scrape it off.

When the magnet assembly is dry you need to cut off the excess mw. No more than 0.3-0.4mm should protrude each side. Sidecutters with hardened jaws or a cut-off disc in a Dremel are good for this. If the mw "axle" stubs are too long they will ruin the coil! Put the shrink tube on the output arm and shrink it. It is there to protect the coil. **DO NOT** get the magnets hot when you shrink the tube – heat will cause them to lose their strength! Shrink it at the tip of the output arm then slide in place in order to prevent heating the magnets.



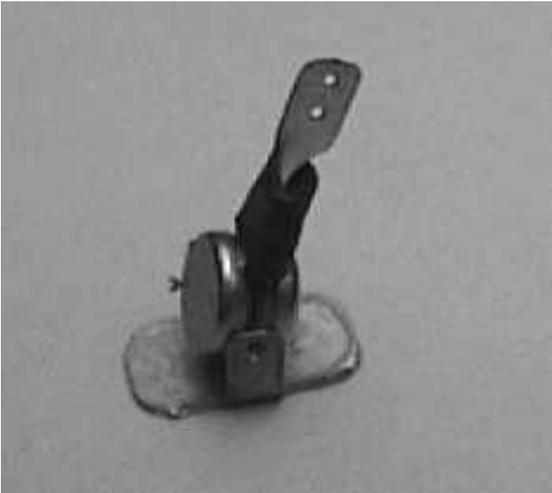
Now you need to make a 90 degree twist in the output arm. Use needle nosed pliers to hold the arm close to the magnet and twist the top half of the output arm with another pair of pliers. If you try to perform the twist by just holding onto the magnet you will most likely split the assembly. You might prefer to add shrink tube/twist output arm **BEFORE** gluing it between the magnets.



Now it is time to prepare the swing frame. It is simply a matter of bending the two arms at 90 degrees to the frame



Place the magnet assembly between the arms and make sure the mw axles enter the holes in the arms. The magnet assembly should be able to swing freely but should not be able to fall out of the frame. Make sure the frame is not twisted to the arms lean to one side



The swing frame/magnet assembly can now be mounted in the coil. The coil will have one end with a slightly larger outside diameter than the other. You should glue the frame this end because it has a larger surface and ensure a better glue joint. Put a TINY amount of glue on the end of the coil where the frame will sit. Epoxy is best because it allows you time to position the frame. Thick CA works too but there is less working time available. Now carefully position the frame so it is perfectly centered in the coil. Nothing should touch the inside of the coil. Be careful not to get any glue inside the coil or onto the magnet assembly since it could ruin the free movement of the magnet assembly. Epoxy can be cleaned off, with CA you don't get a second chance. Once the glue is dry your actuator is ready.



Form a small Z-bend in the brass wire and attach this to a pushrod of your choice. Any magnetic material will disturb the magnet hence the use of brass. The tiny 1x0.5mm magnet can be glued to the side of the coil in order to bias the actuator.

Below is the letter than accompanies my ready made units

Thank you for your actuator purchase

They are individually handmade and tested before shipment. They are fairly robust for their size but do handle them carefully. If you somehow manage to dislodge the magnet assembly from the swing frame it can be difficult to get it back in. In the unlikely event that the swing frame becomes detached from the coil you can glue it back in place with CA. Place a drop of CA on a piece of plastic and pick up a tiny amount with a pin. Smear CA on the edge of the coil and put the swing frame back in making sure it is centered in the coil.

If you need to attach longer leadout wires make sure you use a fine tipped soldering iron and work quickly. Holding the iron on the termination PCB for long periods can harm the coil.

The tiny magnets that are delivered with the actuators can be used for biasing (centering) the output arm. Glue them to the side of the coil so that the output arm is centered.

The brass wire is used for Z-bends. Because of the close proximity to the magnets the Z-bend on the actuator side has to be of a non-magnetic material. Thin carbon rod (0.5mm) is suitable for pushrods.

The actuators resistance is app. 60 ohms. It should not be used with more than one Lithium Polymer cell (3.7 volt nominal). Higher voltage will increase current through the coil and cause it to heat up to a point where it can be damaged.

I prefer to mount the actuators in a small piece of Depron foam and then glue this to the side of the model. Make a hole in the Depron with a soldering iron so the coil is a reasonably tight fit. Another option is to use double sided adhesive. Be careful when removing the actuator again.

Make sure you have a clean workspace when handling actuators. They use very strong N-50 magnets that can attract metal objects. Small pieces of music wire or similar can enter the actuator and foul the mechanism or damage the coil.

Have fun :-)

Michael